

WHAT IS CLAIMED IS:

1. An injection nozzle comprising:

a nozzle body having a first melt channel and a second melt channel, the first melt channel being offset from the second melt channel;

a first valve gating element for selectively opening a first gate;

a second valve gating element for selectively opening a second gate;

a first actuation mechanism coupled to the first valve gating element;

a second actuation mechanism coupled to the second valve gating element; and

means to drive independently said first and second actuation mechanisms to displace said first and second valve gating mechanisms relative to each other.

2. The injection nozzle according to claim 1, wherein the first gate links the first melt channel with a first mold cavity and the second gate links the second melt channel with a second mold cavity.

3. The injection nozzle according to claim 1, wherein the first gate links the first melt channel with a mold cavity and the second gate links the second melt channel to the same mold cavity.

4. An injection nozzle comprising:

a nozzle body having a first melt channel and a second melt channel;

a first valve gating element movable along a first axis for selectively opening a first gate;

a second valve gating element movable along a second axis for selectively opening a second gate, the second valve gating element being movable independent of the first valve gating element, and
wherein the first axis is offset from the second axis.

5. The injection nozzle according to claim 4, wherein the first gate links the first melt channel with a first mold cavity and the second gate links the second melt channel with a second mold cavity.

6. The injection nozzle according to claim 4, wherein the first gate links the first melt channel with a mold cavity and the second gate links the second melt channel to the same mold cavity.

7. An injection molding apparatus comprising:

a manifold having a first manifold melt channel for receiving a first melt stream of moldable material and a second manifold channel for receiving a second melt stream of moldable material;

a nozzle having a first melt channel for receiving the first melt stream and a second melt channel for receiving a second melt stream, the first melt channel being axially offset from the second melt channel;

a first valve gating element for selectively opening a first gate to allow the first melt stream to flow into a mold cavity; and

a second valve gating element for selectively opening a second gate to allow the second melt stream to flow into the mold cavity,

wherein the second valve gating element is operable independent of the first valve gating element.

8. The injection molding apparatus according to claim 7, further comprising a melt channel connector provided between the manifold and the nozzle, the melt channel connector having a first connecting melt channel and a second connecting melt channel,

wherein the first connecting melt channel is in fluid communication with the first manifold melt channel and the first nozzle melt channel, and the second connecting channel is in fluid communication with the second manifold melt channel and the second nozzle melt channel.

9. The injection molding apparatus according to claim 8, wherein the melt channel connector is a bushing for receiving the first valve gating element and the second valve gating element.

10. The injection molding apparatus according to claim 8, further comprising a first actuation mechanism coupled to a first valve gating element and a second actuation mechanism coupled to a second valve gating element.

11. The injection molding apparatus according to claim 10, wherein the second actuation mechanism is located between the first actuation mechanism and the nozzle.

12. The injection molding apparatus according to claim 11, wherein the first valve gating element extends through the second actuation mechanism.

13. The injection molding apparatus according to claim 11, further comprising a bushing surrounding the first valve gating element, the bushing being slidable through the second actuation mechanism.

14. The injection molding apparatus according to claim 11, wherein the first actuation mechanism includes a first piston coupled to the first valve gating element and the second actuation mechanism includes a second piston coupled to the second valve gating element.

15. The injection molding apparatus according to claim 14, wherein the first valve gating element is surrounded by a bushing, the bushing configured to be slidable through the second piston.

16. An injection nozzle comprising:
a nozzle body having a first nozzle melt channel and a second nozzle melt channel;
a first valve gating element;
a second valve gating element;
a first actuation mechanism coupled to the first valve gating element;
a second actuation mechanism coupled to the second valve gating element, the second actuation mechanism positioned between the first actuation mechanism and the nozzle body and configured to allow the first valve gating element to pass therethrough unimpeded;
means to drive independently the first and second actuation mechanisms to displace the first and second valve gating mechanisms relative to each other.

17. An injection molding apparatus comprising:
a nozzle body having first and second melt channels in communication with a manifold melt channel to deliver first and second molten materials to first and second valve gates; and
first and second independently driven valve gating elements operable to control the flow of the first and second molten materials into at least one mold cavity.

18. The injection molding apparatus according to claim 17, wherein the first and second molten materials are different.

19. A method of molding an article made of two different materials comprising the steps of:

- a) providing an injection nozzle having first and second melt channels to direct first and second molten materials via first and second valve gates controlled respectively by first and second laterally shifted gating elements, where each of the first and second gating elements are driven by independent actuation means;
- b) providing a first mold cavity into which the first molten material is injected by opening the first valve gate while keeping the second valve gate in a closed position; and
- c) providing a second mold cavity into which the second molten material is injected by opening the second valve gate.